

WHAT IS CLAIMED IS:

*Sub A47*

1. A wavelength monitoring apparatus comprising:  
an optical device made of a periodic multilayer structure;  
a beam source optically coupled to at least one end surface  
of said periodic multilayer structure, said one end surface being  
not parallel to layer surfaces of said periodic multilayer  
structure; and  
beam detecting means for detecting beam made to exit from  
at least one surface of said periodic multilayer structure at  
a specific angle with respect to a specific wavelength, said  
one surface being parallel to said layer surfaces of said periodic  
multilayer structure.
2. A wavelength monitoring apparatus according to claim  
1, wherein said optical device is made of a multilayer film formed  
on a substrate transparent to the wavelength used.
3. A wavelength monitoring apparatus according to claim  
1, wherein said optical device is made of the periodic multilayer  
structure having layer surfaces perpendicular to a surface of  
a substrate.
4. A wavelength monitoring apparatus according to claim  
1, wherein said beam source is constituted by a semiconductor  
laser.
5. A wavelength monitoring apparatus according to claim  
1, wherein said beam detecting means is constituted by at least  
one photo detector.

6. A wavelength monitoring apparatus according to claim 2, wherein said optical device, a semiconductor laser and a photo detector are mounted on one and the same substrate.

7. A wavelength monitoring apparatus according to claim 5 6, wherein beam emitted from said semiconductor laser is coupled to a beam incidence end surface of said multilayer film by level differences provided on said substrate on which said multilayer film is formed.

8. A wavelength monitoring apparatus according to claim 10 6, wherein said photo detector is provided on a surface opposite to said surface of said substrate on which said multilayer film is formed.

9. A wavelength monitoring apparatus according to claim 15 3, wherein said optical device, a semiconductor laser and a photo detector are mounted on one and the same substrate.

10. A wavelength monitoring apparatus comprising:  
an optical device having a periodic multilayer structure, said periodic multilayer structure defining, at least, a first surface substantially perpendicular to layer surfaces of the 20 periodic multilayer structure and a second surface substantially parallel to the layer surfaces of the periodic multilayer structure;

a semiconductor laser confronted with said first surface; and

25 a photo detector confronted with said second surface.

11. A wave length monitoring apparatus according to claim  
10, further comprising:

a common substrate supporting said optical device, said  
semiconductor laser and said photo detector.

5 12. A wave length monitoring apparatus according to claim  
11, wherein said substrate is transparent, and is contacted with  
the second surface of said periodic multilayer structure.

13. A wave length monitoring apparatus according to claim  
11, wherein said substrate is contacted with a surface of said  
10 periodic multilayer structure other than said first and second  
surfaces.

*Add A67*